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AUTHOR Gates, James D.
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ABSTRACT

The paper presents a brief history, from the 1920s to the present, of the National Council of Teachers of Mathematics (NCTM) on its 75th anniversary. Major points include: (1) significant progress has been made in the content, methods, and accessibility of mathematics classes over the past 75 years; (2) NCTM has shown strong leadership in responding to concerns about the school mathematics curriculum; (3) the NCTM Standards are not the end of the reform effort, but the beginning; and (4) NCTM needs to do a better job of interpreting the Standards for the public at large. (MKR)

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Remarks by James D. Gates
Executive Director
National Council of Teachers of Mathematics
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Introduction

Thank you very much. I'm pleased to be here to celebrate NCTM's 75th anniversary.

This is an exciting time for mathematics education. And a very exciting time to be a mathematics teacher! We have proposed and are achieving a higher level of Standards for both the teaching and learning of mathematics. We are discovering better ways to assess student performance. And we are engaging more students, from diverse cultures and backgrounds, in higher level mathematics.

Yes, this is a very exciting time for mathematics education!

The theme of this Annual Meeting, "Mathematics: Everybody's Heritage, Everybody's Future," brings to light the important role mathematics has played in our past, and the significant role mathematics will play in our future.

It is a well known phrase that history repeats itself. For mathematics educators, this phrase has significant meaning since we have come so far in improving education and in enhancing our professionalism.

We cannot let history repeat itself.

We cannot go back to the days when some children were denied a comprehensive mathematics education

- when mathematics was taught primarily through repetition
- when mathematics was taught as a separate entity
- when mathematics was viewed as "shopkeeper arithmetic"
- and when upper level mathematics classrooms consisted primarily of white male students.

This is the past that we cannot afford to repeat.

But we can learn, and have learned, from our past. And this knowledge is the foundation on which we have laid the groundwork for our current efforts to improve mathematics education.

In preparing this presentation, I reflected on the very thing that has made NCTM so strong—**YOU!** Your active involvement has strengthened NCTM, your profession, and the mathematics education provided to **every child.**

It is only fitting then, too, that you involve yourself—right here, right now.

As educators, we need the appropriate tools to be effective in the classroom. Today, as we commemorate NCTM's 75th anniversary, we need the appropriate tools to celebrate.

Each of you should have had—on your seat—a party hat and a noise maker.

Let's begin today's session by wishing NCTM a very "Happy Birthday." So, **STAND UP!! DON THOSE PARTY HATS! AND BLOW THOSE HORNS! THIS IS A CELEBRATION!!**

Thank you! Now we are ready to continue our celebration! So, let's look into our past—at the eras, efforts and positive effects—at 75 years of NCTM leadership as we “Celebrate Our Heritage.”

Framing an Agenda (1920s)

First we must marvel at the fact that an organization as dedicated as NCTM came into being in the era that it did—the roaring '20s.

The Jazz Age was underway with its nightclubs, raccoon coats, and flappers with bobbed hair and dropped waistlines. The Charleston was THE dance, Clara Bow the IT girl. The Victrola's popularity waned as radio emerged, and Rudolph Valentino lit up the silent film screen. World War I had ended, the Treaty of Versailles was drawn up, the League of Nations established, and women had been granted equal voting rights by the Nineteenth Amendment to the Constitution. Music, song, gaiety, and prosperity characterized the age.

And yet from this merriment arose a group of mathematics professionals who put the times in focus—without mathematics, there would be no rhythm to the music, no rhyme to the lyrics, no angles to the clothes, no advancement to the technology, and no way to tally the votes. Mathematics is an integral part of everyday life.

Educators were seeing an increase in school enrollments. And an increase in the amount of destructive criticism being hurled at mathematics.

As C.M. Austin pointed out, no national organization existed to combat this criticism, or to improve the teaching of mathematics. He realized that working alone, isolated from the experiences and opinions of fellow colleagues, little improvement in the teaching of mathematics would be made.

Austin's vision was “to give mathematics and the teaching of mathematics their proper place in the educational world.”

So, on February 24, 1920, C.M. Austin and a handful of concerned mathematics educators, formed the National Council of Teachers of Mathematics.

This was a bold beginning for NCTM. And in 1921, with approximately 100 members and the publication rights to the *Mathematics Teacher*, the NCTM was well on its way to “make good” on the promise of its founders.

Throughout the 1920s, and well into the next two decades, NCTM worked diligently to take its place as the national voice for mathematics teachers.

The NCTM was there, making your voice heard

- * in 1923 in the final report of the National Committee on Mathematical Requirements;
- * in 1926 with the publication of the first NCTM Yearbook;
- * in 1935 in the Joint Commission to Study the Place of Mathematics in General Mathematics;
- * in 1940 in the Report of the Committee on the Function of Mathematics in General Education, and again in the Report of the Joint Commission to Study the Place of Mathematics in Secondary Education.

But as society changed, so did the demands placed on education.

Swinging with the Changes (1940s)

The 1940s mark a period of mixed change.

The public swirled around the floor to the music of the Big Band era as banks recovered from the stock market crash of 1929. Betty Grable and Dorothy Lamour were THE pin-up girls and Bing Crosby serenaded us with his sincere, melodic voice. Fred Astaire and Ginger Rogers, who danced their way into the hearts of the American public in the 1930s, stepped aside as Humphrey Bogart and Lauren Bacall lit up the movie screen in their rough and tumble romantic style. Shirley Temple with her curly mop of hair was out. Veronica Lake with her sleekly styled hair swept over one eye was in. And Kate Smith made famous Irving Berlin's "God Bless America."

But the 1940s also saw somber activity. During these early years, NCTM reflected the struggle taking place in the schools. Increased enrollment, decreased budgets, larger classes with tremendous ranges in ability and interest, and the threat and then reality of war. As clothes, sugar, gasoline, shoes, hosiery and other household goods were rationed, efforts to improve mathematics education were put aside.

Amidst this activity, NCTM continued its efforts to improve mathematics education and formed a joint commission with the MAA to study "The Place of Mathematics in Secondary Education." In the report released in 1940, the commission pointed out that:

"There are many persons occupying important places in society who to all appearances have negligible mathematics appreciations yet live rich cultural lives. In some cases their study of mathematics evokes unpleasant memories, tempered only by recollection of the joy that accompanied ultimate release."

As the development and wide use of statistical methods increased during this period, so too did the realization that mathematical study should be approached as training in clear thinking. And educators began the long process of rethinking the way in which the teaching of mathematical information, concepts, principles, and skills was shaping attitudes.

Mathematics educators painted the scene in this analogy:

"A student may attend one class in first aid, learn to apply a tourniquet, and later save a life. But such a comparison could not be made from one lesson of algebra or geometry. The very characteristics of mathematics make it necessary to study the subject for a long period of time before any real benefit would be realized."

The inadequacies of mathematics preparation in elementary and secondary schools became strikingly clear as the armed forces increased their demands for mathematically trained people. And NCTM found itself faced with responding to the challenges of developing and releasing a report by the Commission on Post-War Plans. The first report was released in 1944, with two subsequent reports released in 1945. Attempts were made in many places to improve curricula, but most of these lacked the cohesiveness to make any discernible change.

For the first twenty five years, NCTM was essentially an organization of high school teachers, concerned primarily with improving mathematics education at the secondary school level. But, as the years progressed, so too did the diversity of the NCTM membership.

Launching Change (1950s-1960s)

Pony tails, bobby socks and poodle skirts; crew cuts, rolled up jeans, and turned up sleeves...these are the signs of the fifties. Elvis had the public "*All Shook Up*." Ozzie and Harriet shaped our view of the "All-American" family. The Packard was out and the car that few of us remember, yet none of us will forget—the Edsel—was being marketed as the car of the future. Movies were in color and Walt Disney was turning animated pictures into an empire.

By 1950, some trends in mathematics education had become discernible and various studies and experiments were being formulated. Even greater demands for trained personnel were now being made and colleges were expressing their dissatisfaction with both the quality and quantity of precollege instruction. The cry for "good" and "new" mathematics could be heard nationwide.

Among the new developments witnessed by the early fifties were the emergence of the Advanced Placement Program, the appointment of the College Entrance Examination Board's Commission on Mathematics, the appointment of the NCTM Secondary School Curriculum Committee, and the founding of the "Arithmetic Teacher" and "Mathematics Student Journal."

This intensification of interest in mathematics education was reflected in the steady growth of the NCTM membership—from six thousand in 1947, to ten thousand by 1954, to sixteen thousand in 1957.

The Russians' dramatic launching of Sputnik in 1957 had a tremendous motivating effect. For the first time, political and business leaders, educators, and the public-at-large rallied together to improve mathematics education. The reports completed by the Commission on Mathematics and the Secondary School Curriculum Committee provided a foundation to guide such change.

Math teachers were being called to action, and NCTM responded.

NCTM took a vigorous and enthusiastic part in the activity of the decade. The Council expanded its publications program. And the twenty-third and twenty-fourth yearbooks, "*Insights into Modern Mathematics*" and "*The Growth of Mathematical Ideas*" were giant steps toward preparing teachers to cope with future challenges.

Looking back, it's interesting to note the changes that took place in the 1960s—not only in mathematics education but in our society. Hair was worn long, dresses short. A war raged in Viet Nam, protests blocked our public streets, and Woodstock rocked the younger generation. Our nation was at civil unrest as the issue of equal rights came into full view. And the President, John F. Kennedy, succumbed to an assassination attempt.

Of course, one of the most talked about efforts that arose from the 1960s was "New Math." Introduced in reaction to Sputnik, "New Math" was designed to make students mathematically and scientifically prepared to compete at the level of other leading nations. "New Math" was a success in that it encouraged students to go beyond traditional thinking to arrive at solutions to mathematical problems. Unfortunately, the "New Math" revolution had several shortcomings: namely, that we as mathematics educators did not communicate this change clearly and consistently, and therefore, this new way of thinking lacked cohesive support from within and outside education.

Yet, amidst these changes, NCTM continued its efforts to improve mathematics education and to meet the needs of mathematics educators.

For example, in 1960, NCTM conducted a series of regional orientation conferences in mathematics and published the report "The Revolution in School Mathematics."

1960 also saw the formation of a Conference Board of the Mathematical Sciences. Seven mathematical organizations joined together to speak as one voice for the entire mathematics field, and cooperation between mathematicians and mathematics educators became more effective than ever before.

As the decade progressed, NCTM dramatically increased its efforts to unite mathematics educators for the purpose of sharing and networking.

Recognizing that mathematics' attitudes are shaped in the elementary grades, the Council expanded its efforts to provide information to elementary school teachers. In 1966, NCTM released "Topics in Mathematics for Elementary Teachers" a nine booklet series. This was expanded to eighteen booklets in 1968. The Council also expanded its meeting offerings from three each year, to "Name of Site" meetings—today known as Regional Conferences and, of course our Annual Meeting. The change was a wise one. Nearly thirty thousand mathematics teachers participated in NCTM conferences during the 1968-69 academic year—a dramatic increase over the several thousand teachers who participated in the previous year.

NCTM also enhanced its cooperative efforts on the international level. When the First International Congress on Mathematical Education was planned for August 1969 in Lyon, France, more than 600 teachers, educators, and mathematicians from thirty-six countries came together to discuss the problems of reform and innovation in mathematics instruction.

Throughout this era, NCTM's leadership in mathematics education spread widely. More professionals at **ALL** levels—kindergarten through college—became actively involved. And by 1969, membership and subscriptions increased to eighty-two thousand. NCTM was large enough, and strong enough, to make your voice heard.

The revolution in school mathematics that took place during this time caused a rethinking of the curriculum for secondary schools. The changes in secondary school mathematics naturally caused a rethinking of the mathematics programs in elementary schools. We asked ourselves—"How could pupils be prepared for the changed curriculum?" and "How could teachers, confronted with new responsibilities be expected to cope with them?" The answers to these questions took shape as we entered into a new decade.

Math Fever (1970s)

Bell bottoms, hip huggers, and tank tops; wide ties, large lapels, and sideburns. These were the signs of the seventies. The Viet Nam war ended. President Nixon resigned. Model Cheryl Tiegs' sported the "Cover Girl" look. The "Brady Bunch" presented the "new" American family. And the Bee Gees had us dancing under strobe lights and humming the words to "Stayin' Alive."

Usher in the Disco era.

Technology was on the rise and we touted our youth population as being Tuned In, Turned On...and for those of us who were fortunate enough to have teenagers during this decade...Tone Deaf.

The movie blockbuster "Close Encounters of the Third Kind" made us look beyond the moon and stars, and into the possibility that "We are not alone."

NCTM embraced this decade and the technology that it brought. Calculators and computers were being widely introduced into the classroom.

For example

- * the Committee on Computer Education published "Recommendations Regarding Computers in High School Education" in 1972;
- * NCTM built and moved into its own headquarters building in Reston in 1973;
- * and the Board of Directors approved a position statement on the "Use of Minicalculators in the Mathematics Classroom" in 1974.

1974 was also the first year that the United States participated in the International Mathematical Olympiads—placing second behind the Soviet Union. And, NCTM joined with the American National Metric Council to assist in the planning of a smooth transition to metric education. To encourage public support and awareness of the metric system, NCTM formally recognized a "National Metric Week" in 1976. Early supporters of the metric movement noted that "There is no longer any doubt whether the United States will move to the metric system—the only question is when."

We're still waiting for that answer...

Throughout the 1970s, NCTM continued to operate on many fronts, providing special assistance to elementary school teachers, secondary school teachers of general mathematics, and teachers in the inner cities. And, to insure the improvement of mathematics education in future decades, NCTM established a trust fund—the Mathematics Education Trust—dedicated to that goal.

With 1980 fast approaching, NCTM coordinated Project PRISM—Priorities in School Mathematics—to survey priorities for the school mathematics curriculum for the 1980s. Teachers, parents, mathematics educators, and mathematicians were asked their opinions as the Council took on the task of distinguishing "what is" and "what ought to be" taught.

Dispelling the Myth (1980s-1990s)

The 1980s are perhaps best known for spending, prosperity, and technology. Profits were on the rise and movie stars resided in the White House. Tom Cruise was "Top Gun," Michael Jackson was "Bad," and Madonna was fast becoming "a material girl."

Compact disks replaced records. Cordless phones and then cellular phones changed the way we "Reach Out and Touch Someone." VCRs and computers became staples to everyday life and we watched as video games, computer games, and television shows became surrogate parents to our children.

Technology touched every aspect of our lives—from the workplace, to our automobiles, to our homes.

And the public was again crying for change.

- * Employers were dissatisfied with the problem solving abilities of the new work force.
- * Teachers were frustrated that their students were learning "shop keeper arithmetic" in an era of exploding technology.
- * University educators were disappointed with the mathematical thinking of their students.

* Parents were alarmed at the low mathematics achievement levels of their children.

* And students were again asking, "When am I ever going to use this?"

NCTM responded to these voices and began the process of developing a common vision for school mathematics. **We realized that we could no longer do what we've been doing, knowing full well we'll keep getting what we've been getting.**

At the 1980 Annual Meeting in Seattle, NCTM presented "An Agenda for Action: Recommendations for School Mathematics of the 1980s." The document identified critical issues facing mathematics education and made eight recommendations for improving it. In addition, we called for more cohesiveness and coalescence of support within our ranks in order to present a united professional position.

The significance of NCTM's "An Agenda for Action" is great in that it helped lay the groundwork for our current efforts.

As in the past, NCTM eagerly welcomed joint endeavors and enjoyed strong support from other organizations. The Council's "Guidelines for the Preparation of Teachers of Mathematics," released in 1981, received enthusiastic support from the MAA and the CBMS. And, the Council's Equity in Mathematics Education project received a grant from the National Science Foundation to organize a series of conferences to assist elementary and secondary school teachers meet the needs of underrepresented groups.

The turning point in the 1980s came in 1983 with the publication of "A Nation At Risk," which pointed to the mediocracy that gripped American education. Critics were telling us that standards were too low, and that students were ill equipped to embrace the challenges and opportunities of the world around us. That report, while shocking to some, only served to strengthen the resolve of mathematics educators. We had learned a great deal from our more recent past successes and failures.

For example, in the 1960s we learned that changing school mathematics is not a simple matter of recommending, revising, and experimenting with a curriculum.

In the 1970s we learned that mathematics educators alone do not determine the curriculum; but rather that what happens in the schools is the result of very complex factors and the interplay of pressures placed on us by the public and professional sectors.

At this point in our history, we were less naive about change and its possibilities. We knew that if we were to effect lasting change, we needed to work as a cohesive group, to seek opinions from outside our organization and our profession, and to set our sights on improving the whole of mathematics education, including the teaching, learning and assessment processes. The end result was the Standards.

NCTM's *Curriculum and Evaluation Standards for School Mathematics*, published in 1989, presents a vision in which students use mathematics to solve problems, reason, communicate, and make mathematical connections. This is a bold departure from past teaching practices that relied primarily on memorization of rules and completion of repetitive exercises.

The *Professional Standards for Teaching Mathematics*, published in 1991, illustrates ways in which teachers can structure classroom activities to encourage more interaction and exploration. Standards are identified for all aspects of mathematics teaching, including professional development, evaluation of teaching, and the support and development of mathematics teachers.

And the *Assessment Standards for School Mathematics*, which will be released next month, asserts that high public expectations can be set that *every student* can strive for and achieve. Two constant themes run throughout the document. The first stresses the importance of equity and that decisions regarding student achievement should be based on information gathered from multiple sources. The second is that **teachers** are in the best position to judge student performance.

The NCTM Standards serve as a rallying point for all who have a vested interest in mathematics education. The three documents present a vision of mathematics that encourages heightened levels of achievement for **all** students.

The Standards are not the end to our efforts, they are just a beginning!

As efforts to improve education expand to areas outside mathematics, we will begin seeing our NCTM Standards defined and evaluated by the quality and effectiveness of Standards released for other curriculum areas. We are no longer alone.

Commentary on the changes taking place in the classroom will probably increase, raising questions about their efficacy, cost, and role in education. **We can, and must, do a better job of letting the public at large know what it is that we profess.**

The Standards are guidelines, not rules. They are voluntary, not compulsory.

The Standards encourage mental mathematics, estimation and the need for young students to have a good grasp of arithmetic operations in order to become effective problem solvers. They represent a consensus view of educators and administrators, leaders in government and the private sector, and lay persons about what constitutes a comprehensive mathematics education.

The Standards give direction toward a set of national expectations while allowing and encouraging local initiatives.

The NCTM Standards attempt to make mathematics accessible to **all students**. **And they are succeeding!**

The notion of making mathematics accessible to every student is perhaps our greatest challenge. Every student, regardless of race, culture, gender, or personal achievement, should be provided an opportunity to engage in and excel at higher level mathematics.

The NCTM Standards not only encourage equity, they demand it.

Perhaps author Robert Full-hum defines the idea of equal access best in a story that has been retold by countless others including former First Lady Barbara Bush. Fullhum's story is about a young pastor who, finding himself in charge of some very energetic children, stumbles upon a game called "Giants, Wizards and Dwarfs."

"You have to decide now," the pastor instructed the children, "which you are—a giant, a wizard or a dwarf?" At that, a small girl tugging at his pants leg asks, "But where do the mermaids stand?" The pastor tells her there are no mermaids. And she says, "Oh yes there are. I am a mermaid."

Now this little girl knew what she was, and she was not about to give up on either her identity or the game. She intended to take her place wherever mermaids fit into the scheme of things.

Where do the mermaids stand—all those who are different, those who do not fit the boxes and the pigeonholes? "Answer that question," wrote Full-hum, "and you can build a school, a nation, or a whole world."

Celebrating Our Heritage

We are in a transition period right now. At times, fascinating and exhilarating. At other times, frustrating and exhausting. We are all learning to adjust to changes, learning to make new choices, and learning to put into practice the Standards we worked so hard to define.

In this anniversary year, we look to our past. Our successes and our failures are the very reason we are here today.

Sir Isaac Newton said that the reason he could see so far was that he stood on the shoulders of giants. For all of us in NCTM, we have also stood on the shoulders of giants—and wizards, and dwarfs, and yes, even mermaids. And today, we are standing on the shoulders of the dedicated and inspired workers of the past 75 years. With more than one-hundred twenty thousand members and 260 affiliated groups, NCTM is a driving force in mathematics education. And we have each and every one of you to thank for our success.

This 75th Anniversary celebration honors all the mathematics teachers, past and present, who have dedicated themselves to educating our youth. I hope you'll join President Jack Price and myself at the reception on the third level of the Hynes Convention Center, as we continue this special occasion.

**SO, STAND UP!! PUT ON YOUR PARTY HAT! BLOW YOUR HORN!
LET'S CELEBRATE!!.**

**MAY THE NEXT 75 YEARS BE EVEN MORE GLORIOUS THAN THE
FIRST 75!**